Mechanical Vibration ... in Therapeutics ...

BY

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By SAMUEL S. WALLIAN, A. M., M. D.
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[Third Paper.]

From the combined experience of many observers, the therapeutic possibilities of mechanical vibration may now be more confidently stated.

On the circulation it can be made to produce definite and apparently contradictory results. In other words, arterial tension can be either increased or diminished, according to the methods and intensity of application, and any given viscus or tissue can be made hyperemic or relieved of hyperemia, at will.

Again, the tension or activity of any special nerve center can be either increased or diminished, and dormant nerves, whether afferent or efferent, can be aroused and restored to normal function. Local congestion can be induced, and the same condition can be dispersed. Hyperesthetic nerves and areas of hyperesthesia can be quickly relieved, and all the vital processes, metabolism, nutrition, assimilation and elimination markedly accelerated.

Relying on these effects, clinical results abundantly corroborate the logical inference that vibration, intelligently applied, can be made to materially assist in reducing hypertrophies and discussing nearly all forms of neoplasms and morbid growths.

Since the Roentgen and ultra-violet rays are simply immeasurably rapid forms of vibratory motion, it follows that their action is a result of this motion. According to Sajous, the philosophy of the action of rapid vibratory impulses in destroying morbid tissues is thus explained:

They cause a local heat accumulation and congestion, which induces a rapid and extensive immigration of nutrophile leucocytes, and these, through their phagocytic and fibrogenetic properties, convert the degenerated cellular elements into benign products.

Mechanical vibration, in a lesser degree, reaches the same results. It induces local hyperemia, a local increase of temperature, and a prompt influx of leucocytes and phagocytes, whence follows that process of phagocytic digestion which is Nature's method for the removal of abnormal or malignant growths and infiltrations.

It has long been known that manual manipulation or massage, is in many cases a valuable auxiliary in the treatment of these maladies, and it is easy to understand that by increasing the depth, force and frequency of the applied impulses, by mechanical means, the salutary effects are decidedly increased.

Control of the circulation, and concurrently of local heat production, explains the process and accounts for the results.

To go more into detail, superficial applications of mechanical vibration stimulate the cutaneous circulation, and promote the nutrition of the skin. Its secretions are stimulated, so that a previously harsh and dry skin becomes softer and more supple.

The induced increase in the force of the circulation, and the promotion of nutritive and eliminatory processes results in a perceptible increase in the number of red corpuscles and of hemoglobin.

Superficial applications also stimulate the lymphatics and absorbents, the value of which, in all morbid conditions, is self-suggestive.

I consider vibratory stimulation of the lymphatics and absorbents of the utmost value in connection with the use of the X-ray, ultra-violet ray, and high frequency currents, when treating malignant growths. With this combination I am convinced that some of the reported failures in the use of the X-ray could have been made successful.

By deep applications, the deep-seated nerve ganglia can be reached, and profoundly affected, and, as in case of superficial applications, the action of these ganglia may be either stimulated or inhibited, according to the length and intensity of the applications. In fact, the great field of mechanical vibration is in connection with these ganglia, and with the recognized trophic centers of the nervous system. Each of the spinal ganglia is a storage battery of vital electricity, and each is credited with presiding over some one function or process. When the ganglia radiating to, and in the main controlling any area or organ is stimulated, that particular organ or area responds. Of course, it is understood that many ganglia are closely interrelated, and thus provide auxiliary power, one for the other, in case of accident.

Omitting much that might be said concerning trophic centers, heat centers, nutritive centers, etc., a dormant or debilitated ganglia may be stimulated, and often fully restored to normal activity by an intelligent application of mechanical vibration.

Coming at once to the illustration and practical application of the treatment, the patellar reflex is an apt instance. It receives its impulse and is controlled by the second and third lumbar ganglia. This is merely an illustrative example.

To take up this line of study systematically, the brain may be reached and influenced by applications made over several pairs of ganglia, ranging from the second to the seventh dorsal. The eyes through the third cervical, and, to some extent, through the various centers as low as the fourth dorsal. Recent cases of ptosis of the eyelid have been promptly relieved by deep applications over the seat of the third cervical. The external ear is reached through the sixth cervical. The middle ear may be influenced by applications made from the second dorsal upward, as well as by applications to the front and sides of the neck.

In treating the throat, the applications are to be made by suitable "vibratodes" behind the rami of the inferior maxillary. In anemic conditions of the throat, these applications should be very light, so as to stimulate, while in congestive conditions deeper pressure will be more effective in disgorging the blood vessels, and dispersing the congestion. In acute and subacute pharyngitis and laryngitis, as encountered in professional singers, some very striking results can be obtained. In these cases, vigorous stimulation of the lymphatics of the neck and axillary region, and also brisk stimulation of both the liver and spleen will add to the effectiveness and permanency of the treatment.

The heart is reached through various centers, all the way from the third cervical to the fourth dorsal. To affect the lungs, deep vibration is to be applied to the third, fourth, fifth and sixth dorsal centers. Alternate applications to the right and left fourth dorsal. To relax

an obstructed pylorus, deep applications are to be made over the fourth dorsal on each side alternately, and to the solar plexus and pneumogastrics.

From the sixth to the ninth dorsal of the right side influence the liver, while the same pairs of the left side control the spleen.

The eighth dorsal is associated with the pancreas, to reach which the solar plexus should also be invoked. The latter more or less influences all the pelvic viscera.

Nausea, from the usual causes, can generally be relieved by vigorous but very transient vibration applied to the fourth dorsal of the left side.

When the pelvic organs are diseased or congested there will ordinarily be found one or more hyperesthetic points along the spine—the fifth lumbar and the eighth dorsal, more frequently than other points. In ovarian trouble, it will generally be found that the fifth lumbar and twelfth dorsal are directly involved.

As this paper does not aim at more than a mere outline of the subject, these brief sketches of the technic of treatment must suffice.

One general caution may be urged, namely, that the amateur operator is almost certain to overdo the treatment. As a rule, the applications must be very brief —not more than ten seconds at a time at one point. This is especially true when deep pressure is being applied.

As to machines, the market is now pretty well supplied, at prices ranging from $25 to $200.

As I have no personal axe to grind, I feel at liberty to speak with entire frankness. I have now used all the leading machines before the profession. Among the number many were evidently designed for the use of masseurs and barbers, and while they accomplish mechanical massage, they are of but little value for therapeutic purposes. Most machines are limited to one of two motions—oscillation or percussion. They either give a simple percussion blow, or they give a rubbing motion with slow strokes. This answers the purposes of the masseurs and barbers. The best machines combine oscillation with percussion, and have a rapid stroke —seven thousand to nine thousand per minute. The highest priced machine claims much for its "rigid arm." This loudly vaunted feature is not without its disadvantage. It secures arm-rigidity at the cost of universal adaptability. It delivers its stroke exclusively in a downward direction, which compels the patient to recline on a table or couch, whereas with the flexible-arm machines, applications may be made in any direction, the patient sitting, standing or reclining, as seems best. Although a preponderance of treatment will be given with the patient in the prone position, with muscles thoroughly relaxed, it is sometimes both convenient and important to be able to make applications to a sitting or standing subject.

Furthermore, this rigid-arm machine is cumbersome, ungraceful as an office fixture, and its price is entirely out of proportion to either its cost or its practical advantages. Equally effective apparatus can be had at less than half the price asked for this one. Some of the flexible-arm machines, on the other hand, are quite undesirable, imparting too much motion to the hand of the operator, spitting oil on the clothing of the patient, and easily getting out of order.

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